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ABSTRACT

In order to clarify the opinions of various groups concerning goals for the School of Education of the University of Virginia, a questionnaire asking for suggestions on major objectives for the school was sent to 421 persons from groups arbitrarily defined as representing the "power structure" of Virginia as it relates to teacher education. The 298 responses were reduced to 61 generic statements, which were then constructed into a second questionnaire asking respondents to rank each item on a five-point scale. The 262 responses from the second questionnaire were analyzed to determine the mode of the priorities assigned to each item, and a third questionnaire containing the original items, the group consensus (mode) for each item, and the respondent's original rankings was constructed. Respondents were asked to reconsider their rankings and state their reasons whenever they wished to remain outside the consensus. The fourth questionnaire, containing the recomputed mode for each item, the respondent's prior ratings, and a list cf major dissenting opinions gathered by the third questionnaire, asked respondents to once more consider their rankings. Final rankings were then computed on the basis of the fourth questionnaire. (Analysis of the findings includes discussion of typical response patterns of each group and presentation of highest and lowest ranked items.) (RT)

THE DELPHI TECHNIQUE: A TOOL FOR COLLECTING OPINIONS IN TEACHER EDUCATION

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The Need

It is a truism that many schools of education have for too long attempted to be all things to all people. They have been prime targets for the phenomenon of goal displacement, i.e., the tendency for organizations to turn away from original goals and to substitute means for ends. It is reasonably obvious that giving the Master's degree has become an end in itself, and schools of education have long since forgotten the goal which originally called for that degree program. Added to this concept of goal displacement is a second prevalent phenomenon which has been labeled problem displacement. This is the substitution of organizational concern for trivial problems in place of significant problems because the significant problems appear unsolvable. Clearly, schools of education need to give fresh attention to the clarification and hierarchal ordering of goals if they are to increase their effectiveness.

It also appears that most schools of education and, for that matter, most universities, operate on the apparent assumption that persons inside the organization control its destiny. While no one can deny the significant and essential influence of students, faculty, and administration, it is equally fallacious and dangerous to deny or ignore

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the powerful impact of forces and persons outside of the organization on its welfare and mission. Perhaps one of the reasons why schools of education have not received the support they desire, on either a moral or fiscal level, is that they have not assessed accurately, if at all, the judgments being made about them by others. The need for scientifically assessing the needs, desires, and opinions of clientele was behind the exploration of the potentialities of the Delphi Technique by the School of Education of the University of Virginia.

The Delphi Technique

The traditional method for achieving consensus is to conduct a round-table discussion among influential individuals and have them arrive at an agreed-upon group position. This procedure has a number of objections. The final position is usually a compromise between divergent views. This compromise position often is derived under the undue influence of certain psychological factors such as specious persuasion by the group member with the greatest supposed authority or even merely the loudest voice, an unwillingness to abandon publicly expressed opinions, and the bandwagon effect of majority opinion. The Delphi technique, on the other hand, is a procedure in which an attempt is made to overcome these factors by not bringing the participants together in one place and by not reporting individual opinions.[1]

The Delphi technique eliminates completely committee activity

and replaces it with a carefully designed program of sequential interrogations interspersed with information and opinion feedback. The questioning usually is conducted best by a series of questionnaires.

Helmer believes the principles involved in the technique can be explained best by referring to an example.[2] He provided such an explanation as follows:

> When inquiring into the future of automation, each member of a panel of experts in this field was asked to estimate the year when a machine would become available that would comprehend standard IQ tests and score above 150 (where "comprehend" was interpreted behavioristically as the ability to respond to printed questions possibly accompanied by diagrams). The initial responses consisted in a set of estimates spread over a sizeable time-interval, from 1975 to 2100. A follow-up questionnaire fed back to the respondents a summary of the distribution of these responses by stating the median and--as an indication of the spread of opinions--the interquartile range (that is, the interval containing the middle 50% of the responses). The respondent was then asked to reconsider his previous answer and revise it if he desired. If his new response lay outside the interquartile range, he was asked to state his reason for thinking that the answer should be that much lower, or that much higher, than the majority judgment of the group.
>
> Placing the onus of justifying relatively extreme responses on the respondents had the effect of causing those without strong convictions to move their estimates closer to the median, while those who felt they had a good argument for a "deviationist" opinion tended to retain their original estimate and defend it.
>
> In the next round, responses (now spread over a smaller interval) were again summarized, and the respondents were given a concise summary of reasons

> presented in support of extreme positions. They were then asked to revise their second-round responses, taking the proffered reasons into consideration and giving them whatever weight they thought was justified. A respondent whose answer still remained outside the interquartile range was required to state why he was unpersuaded by the opposing argument. In a fourth, and final round these criticisms of the reasons previously offered were resubmitted to the respondents, and they were given a last chance to revise their estimates.[3]

The Delphi technique was used by the United States Air Force for developing consensus among a group of experts concerning a forecast of the international situation between the years of 1966 and 2015. A consensus was developed on most questions through the use of the technique. Although there was no way of validating the specific forecasts, the results were considered to be of interest to those who were concerned about future developments in the field of international relations.[4]

A study of short term predictions was conducted with twenty graduate business students at the University of California in Los Angeles during the fall of 1965. The students were asked to forecast the gross national product, defense expenditures, and fourteen other business indexes. The students had arrived at a general consensus after a series of four questionnaires. The forecasts were checked later with the actual happenings. Although the consensus of the students varied greatly from what actually occurred in certain indexes, they

achieved accuracy of ten per cent or better in most cases. It was significant that the consensus predictions were better on thirteen of the sixteen items than the prediction of twenty graduate students who were not involved in the process.[5]

The Institute of Government and Public Affairs at the University of California in Los Angeles used the Delphi technique in an attempt to generate some useful perspectives on changes in American Education.[6] Adelson, Alkin, Carey, and Helmer summarized the values as follows:

> Whatever the validity of the formal results, the behavioral results of the procedure are very instructive. The principal one is that the participants in the exercise found it very difficult, in some cases painful, to make the required choices, to forego "desirables" for "more desirables." It should be remarked that these were all people with a vital and informed relation to the field. They were people familiar enough with the decision process in one setting or another that one might have thought them to be adept at and comfortable with the need to decide. And perhaps they were. But they were operating on a new scale, and since they took the exercise seriously, and felt a degree of responsibility for the quality of the intended result, there was much soul searching and argument. There was also ready capitulation by some of the participants who appeared to feel either that their opinions were not worth much, or else that the information available did not justify very deep involvement. Unless they had strong objectives or objections, these people let the others decide for them. Nevertheless, the authors got the impression that the procedure was looked on by almost all of the participants as potentially very useful in educational planning at all levels.[7]

Implementing The Survey

Once the decision to use the Delphi technique for clarifying the opinions of clientele concerning goals for the School of Education was reached, a series of concrete tasks and decisions necessary for implementation began to emerge.

The selection of the sample to be involved in the survey involved a rather arbitrary defining of the "power structure" of the Commonwealth of Virginia as it relates to teacher education in general and the School of Education in particular. It was decided to include six major categories of persons including personnel from the University of Virginia Campus: 1) the faculty of the School of Education and selected student leaders from the graduate and undergraduate populations, and 2) those persons in leadership positions such as deans, the President's Cabinet, and the elected members of the University Faculty Senate. The off-campus elements incorporated into the sample included: 3) educators, i.e., elementary and secondary school teachers and administrators who held elective office in statewide professional organizations. Also included were the deans of the States' major schools of education, 4) organizational leaders, not necessarily professional educators, such as the officers of the Virginia School Boards Association, the Virginia PTA, the State Council of Higher Education, the State Board of Education, 5) persons of paramount influence in political circles,

e.g., the education committees of the Virginia House and Senate, U. S. Senators and Representatives, the Governor, etc. 6) The second largest group, representing another significant community element, included leading newspaper editors and persons dealing with education in such groups as the Virginia AFL-CIO, N.A.A.C.P., Virginia Farm Bureau, and the Virginia Chamber of Commerce. In addition, it was decided to seek perspective by including a seventh group of selected teacher educators of national reputation from across the nation. The initial sample, then, included a total of 421 persons categorized as follows: 1) 89; 2) 58; 3) 41; 4) 48; 5) 73; 6) 82; 7) 30. No person was informed of the classification which was the basis for his inclusion, or of the groups and other individuals involved in the survey.

It must be emphasized that this sample in no way resembled a random selection such as is used in national opinion polls. Each person was chosen because he represented a significant segment of the power structure relating to the School of Education. It was assumed throughout the study that what those persons in positions of influence believe will happen or should happen is the best indication of what actually will occur in the near future.

To the best of our knowledge, the technique, previously had been used primarily to seek reactions to items devised by those executing the

study. However, because seeking reactions to items which were the products of professional educators might severely stereotype and delimit the range of possible targets to be considered, it was decided to solicit items from the same population that would be asked to rank items. Respondents were asked to suggest prime targets on which the School of Education should concentrate its energies and resources in the next decade. For this purpose, a questionnaire was devised for collecting items in a usable form. (See Exhibit #2.) It attempted to define the nature of the statements desired. It was also designed to limit the length of individual responses since a pilot attempt had shown that respondents tended to incorporate several ideas in each suggestion, making the combining of similar items a most difficult task. Questionnaire I was accompanied by a personalized letter explaining the purpose of the survey and the activities involved in the technique. (See Exhibit #1.)

Questionnaire I was returned by 298 persons or 68% of the sample. Over 750 individual suggestions for targets were received. These were reduced to 61 generic statements by the Project Advisory Group. This group, consisting of five knowledgeable persons, categorized the raw statements received and constructed generic statements which encompassed related ideas.

Questionnaire II contained a random listing of the 61 items, together with a five-point grid for rating each item on a high-low priority continuum. Its purpose was to differentiate between the items in the list in hierarchal fashion. The instrument also included one bogus item which was devised by the study director. This was inserted to test the hypothesis that, through a process of inserting bogus items and distorting the respondent's reaction to them, it would be possible to mold opinion as well as to collect it. Questionnaire II (See Exhibit #3) was mailed to the original sample of 421. Two hundred sixty-two responses were received.

The responses from Questionnaire II were processed in a computer to determine the distribution and mode of the priorities assigned to each item. These data were essential for the construction of the next instrument which differed from its predecessor only in the fact that it reported both the group consensus and the individual respondent's prior rating for each item. (See Exhibit #4.) Each replier was asked to re-rate all items in light of the additional information concerning group feeling. It was not necessary for him to change his ranking on the parts of Questionnaire III. However, for all items where the participant wished to remain outside of the consensus, he was asked to succinctly state his primary reason for so doing.

The ratings on Questionnaire III were computed to determine any changes which had occurred in the distribution of priorities. Questionnaire IV was then constructed. (See Exhibit [redacted]) It contained, as before, the mode for each item and the respondents' prior ratings. However, also included in the packet mailed to participants was a listing of the major "dissenting opinions" gathered by the prior instrument. (See Exhibit 5) These 3,623 minority opinions were synthesized into 218 generic statements by the Project Advisory Group. The respondents were asked to arrive at their final ratings, based upon their own values and a knowledge of both majority and minority views. This final ranking of items was tabulated on the base of 262 returns or 62 percent of the original population. Of these, 194 had changed ratings on Questionnaire IV.

Conclusions Regarding The Technique

The reader should be acutely aware of several differences in the way this study applied the Delphi Technique from its use in preceding studies. First, the Technique has usually been used with groups of fifty or fewer respondents, rather than with the four hundred involved in this survey. Second, most participants in prior studies have felt some greater degree of expertise in the field being surveyed than did participants in this survey. Third, and perhaps

most significant, the Technique has generally been used to predict what will happen rather than to seek agreement concerning what should happen. Fourth, consensus in this study was defined as the mode of the distribution of ratings on each goal, where other studies involving this Technique have defined consensus as the interquartile range. It is speculated that item three above was instrumental in the response divergence which necessitated the choice of the weaker concept of mode as the agreement indicator.

However, several significant generalizations concerning the Delphi Technique in action grow out of this experience with it. The following items seem particularly relevant to its use in projects similar to the one described herein.

1. On Questionnaires I and II, several members of the sample declined to participate on the grounds that only professional educators had the knowledge necessary to arrive at valid responses. While this study proceeded on the assumption that lay citizens are as competent to determine goals of public institutions as are professionals, the message is clear that prospective participants must be made to feel that their response is valid so that they will take part.

2. The participants in the study expressed considerable interest in the Delphi Technique. Numerous requests for infor-

mation concerning the Technique were made by those involved in the study. Based on these requests, more than twenty packets of material related to the Delphi Technique were distributed. Those requesting such materials included laymen as well as educators. Many of the respondents indicated that it took considerable time to complete each questionnaire, but because of the importance of the study and because of their interest in the technique being utilized, they were willing to participate. The project director received numerous letters from both lay and professional persons included in the study requesting rapid dissemination of the final results of the study.

3. The number of goals on which a person agreed with the consensus ratings varied greatly. The degree of agreement with the consensus rating on all the goals by individuals ranged from less than twenty percent to agreement with one hundred percent of the consensus ratings. Persons agreeing with a large percentage of the consensus ratings and those agreeing with a small percentage were found in every designated grouping. The differences in agreement within a group were greater than the differences in agreement between the groups.

4. The Project Advisory Committee felt somewhat uncomfortable with the possible distortion which could occur when

original responses from individual participants were translated into general generic statements, as was done with targets following Questionnaire I and with dissenting opinions following Questionnaire III. However, all participating groups, with the exception of a vocal minority within the School of Education faculty, felt that the true intent of individual answers had been captured in the generalized statements.

5. There is considerable administrative work and problems associated with the Technique. Individual records for each respondent must be maintained to determine changes and prior ratings. The synthesizing of free responses into communicable generalizations is a tremendously time-consuming activity. The preparation and mailing of several generations of questionnaires, as well as the tabulation of data, is no small task. The amount of administrative work is directly associated with the size of the group being involved.

6. The initial response to the bogus item was predominantly negative. After the consensus was distorted and reported as positive, and the reasons given for assigning the item a low priority were altered and reported back to the respondents as reasons for rating it high, the final consensus showed this item rated considerably above average, although not among the ten highest ranked targets. The hypothesis that the technique can be used to mold opinion as well as

to collect it was supported. The bogus item read "Emphasizing the production of doctoral graduates who can improve the programs in Schools of Medicine, Law, Nursing, and Engineering."

7. Written comments by the respondents were often returned with the questionnaires. These comments provided interesting highlights to the study. For example, when respondents disagreed with the consensus rating of a goal, they tended to make a comment in which the consensus was attributed to a group of which they were not a member which they believed to be included in the study. A typical statement was: "The consensus rating on this goal indicates that too many administrators are included in this study."

Comments were submitted by the participants that indicated they were concerned about the implementation of the goals rated in the study. An anxiety concerning the implementation of a goal was particularly apparent when an individual disagreed strongly with the consensus rating. Although such a concern was expressed by the respondents generally, persons holding administrative positions tended to express a belief that establishing the goals of an organization by such a process was justifiable and was worthwhile. Teachers and employees, as opposed to employers, expressed opinions that indicated a belief that establishing organizational goals by the described procedure could interfere with their personal goals.

8. It is apparent that virtually all (99%) of the respondents' change in opinion from their initial rating of the items occurred on Questionnaire III which informed them of the initial "consensus" reached by the total group. On that instrument, the mean amount of movement was one and one-third scale points in the direction of the printed consensus. The magnitude of this movement is significant at the .01 level. On Questionnaire IV, by way of contrast, the movement averaged less than 1/10 of one scale point, and was almost equally divided between movement toward and movement away from consensus. The movement on Questionnaire III toward the printed consensus had been anticipated, but the expected movement away from consensus on Questionnaire IV, as the result of having initial access to the minority opinions, failed to materialize. With hindsight, one can seriously question the need for going beyond Questionnaire III.

The University Family was the group making the greatest change in ratings throughout the study, while the Off-Campus Educators group modified original ratings least.

Substantive Findings And Generalizations

The data from the survey were analyzed in several ways. Obviously, the primary interest centered around the goals which received highest priority by the "power structure" population. These

formed the basis for faculty deliberations and decisions concerning immediate targets for the School. The data were also inspected to determine differences in values between classifications of respondents, as well as their varying tendencies toward change. A data summary was distributed to participants. (See Exhibit #10 i)

1. In general, the targets ranked highest by respondents were concerned with increasing the quality of the educators graduated by the School, the improvement of the School's curricula, and the discovery and development of the knowledge needed to bring about this greater quality. (Priority #2 was earned by "Developing better methodology of teaching through research on such topics as motivation, study skills, individual differences, child development, creativity, the learning process, constructive thinking, cost, communication, educating the physically handicapped, teaching large groups, and discipline."; Priority #3 - "Preparing educators to function effectively in innovative programs which deal with constantly changing educational problems."; Priority #4 - "Developing knowledge concerning the effective preparation of teachers."; Priority #6 - "Developing programs of nationally recognized excellence.")

2. Two items among the "top ten" dealt almost exclusively with problems of increasing the quantitative supply of teachers. Priority #1 was given to the target of "Increasing the number of talented young people who enter and remain in the teaching profession" and priority

#8 was awarded to "Attracting more men into elementary education." None of the ten lowest ranked items was related to questions of teacher availability.

3. Goals which suggested that the School of Education should extend direct services to the State's elementary and secondary schools were generally not favored. Such items appeared only once among the highest ranked targets (Priority #10 - "Developing more equally balanced school divisions") and appeared frequently among the ten lowest rated items. (Priority #61 - "Preparing plans which schools could use for goal definition"; priority #60 - "Preparing interdisciplinary courses for high school adoption"; priority #59 - "Assisting schools to develop better school buildings through such means as standard construction elements"; priority #56 - "Promoting uniformity in basic subjects throughout the State"; and priority #54 - "Developing quality courses for adoption and adaption by elementary and secondary schools.")

4. Targets which implied an increasing direct leadership role for the School of Education in its relationships with other Schools of Education in Virginia received consistently low priority. No such items were included among those ranked highest, yet two of these relatively few items appeared in the lowest ranked category. (Priority #62 - "Eliminating competition among institutions of higher learning

in Virginia"; priority #57 - "Developing a knowledge base which sets the parameters of capability and modus operandi of a School of Education's functions.") Only the item "Preparing instructional materials for use by teachers in colleges and universities" received a ranking above the mean.

5. Respondents were able to differentiate among emphases they would or would not like to see in the curricula of the School. To illustrate, a high priority of #9 was given to "Preparing teachers and administrators at the graduate level without requiring prior experience" while the item "Modify the curriculum of the School of Education to give greater attention to Negro history, occupational orientation of children, and citizenship education" was ranked #58. "Developing teachers with international perspective" and "Developing programs applying systems analysis to education" also appeared among the ten lowest rated goals.

6. When one examines the highest and lowest targets ranked by each subgroup, he discovers that no subgroup ranking corresponded completely with the total study consensus of either the highest rated or lowest rated items. The closest subgroup-total group agreement came when nine of the ten highest ranked consensus items appear among the top rated items of the School of Education faculty subgroup. The least subgroup-total group agreement occurred when only three

of the lowest rated items of the Prominent Organizations members subgroup appeared on the consensus lowest ranked list. This subgroup, as a whole, was in less agreement with the overall consensus than was any other category of respondent.

7. It is interesting to note those items which generated the greatest amount of disagreement among the survey participants. Item #35 ("Preparing teachers and administrators at the graduate level without requiring prior experience.") was ranked among the top ten targets by the group as a whole, but was ranked among the lowest priorities by two of the subgroups, those in political life and those who are leaders in educational organizations. The major support for this item came from the School of Education and the University Family.

Item #31 ("Promoting uniformity in basic subjects throughout the state.") fell in the consensus list of ten lowest ranked items. However, it was rated among the top ten goals by politicians and leaders in prominent non-educational organizations. The National Panel, the School of Education, and the University Family gave least support to this target.

Item #40 ("Eliminating competition among institutions of higher learning in Virginia.") was the lowest ranked consensus item of the sixty-two in the entire survey. However, it was among the highest ten rated items of the Off-Campus Educators subgroup.

This was the only subgroup to give substantial support to this target.

Item #60 ("Developing more equally balanced school divisions."), the one service-oriented target appearing among the consensus leaders, was rated among the lowest desirable goals by the National Panel. Off-Campus Educators, the School of Education, and the leaders of Educational Organizations constituted this target's chief support.

In conclusion, the data generated by this study are quite usable for assisting in formulating the future targets of the School of Education. These data also have face validity, yet they differ significantly from the emphases postulated prior to the study. Given similar opportunities, the experiment would be repeated. In addition to the satisfaction of planning one's future with the assistance of data, a pleasant change in educational circles, the survey made the influential persons in the Commonwealth aware of the School's existence and vested interests in its future accomplishments.

Footnotes

[1]Olaf Helmer, Analysis of the Future: The Delphi Method (Santa Monica, California: RAND Corporation, 1967), p. 7.

[2]Ibid.

[3]Ibid.

[4]Joseph P. Marino, "An Experiment with the Delphi Procedure for Long-Range Forecasting, Part II," (n.p. Air Force Office of Scientific Research, n.d.), pp. 1-12 (Mimeographed).

[5]John Pfeiffer, New Look at Education (Poughkeepsie, New York: Odyssey Press, 1968), pp. 152-157.

[6]Marvin Adelson, "Planning Education for the Future: Comments on a Pilot Study," American Behavioral Scientist, Vol. 10, No. 7 (March, 1967), pp. 1-31.

[7]Ibid., p. 27.